UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Environmental Fate & Groundwater Branch
November 9, 1993

Memorandum

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

To: **Mr. George LaRocca**
Registration Branch (7505C)

From: **Paul L. Zubkoff, Chemist** Paul L. Zubkoff 11/9/93
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Thru: **Henry Nelson, Section Head** H Nelson
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Thru: **Henry Jacoby, Chief** Henry Jacoby
Environmental Fate & Groundwater Branch / EFED (7507C)

Subject: **Avermectin B_1** **Chemical Code: 122804** **DP Barcode: D179965**

Use of Avermectin B_1 on Vegetable Crops (strawberries, tomatoes, celery and head lettuce)in Western Region (California, Arizona and Texas) and Florida

Documents reviewed pertinent to the use of Avermectin B_1 on vegetable crops (strawberries, tomatoes, celery and head lettuce) grown in the Western Region and in Florida according to the registrant's voluntary restrictions indicated on the May 1993 label do not provide an undo runoff risk to surface waters because:

1. The crops are grown on beds with irrigation during dry seasons,
2. Irrigation programs preclude the use of excessive irrigation which causes runoff; any runoff from the crop must be contained within the field and reutilized.
3. The beds are prepared with minimal slope (<~1% grade).

Important environmental fate properties are:

1. The partition coefficient (K_{oc} or K_d) of Avermectin B_1 is relatively high (K_d = 134, Branyon Clay; K_d = 9.7 sand; and K_d = 30.9 on silt loam), indicating a relatively high binding to soils,
2. The solubility is relatively low (5 ppm at 20$_o$C),
3. The vapor pressure is low (1.5×10^{-9} torr),
4. The hydrolysis rates indicate stability at pH = 5, 7 and 9,
5. The major route of degradation is by photolysis ($T_{1/2}$ = ~12.5 h)

Review of Public Materials submitted by Merck & Co. in support of their voluntary product restrictions and assessment is consistent with aquatic exposure due to potential runoff of Avermectin B_1 is less than that previously estimated.

Public materials submitted by the Registrant for the above action and reviewed by EFGWB included:

Runoff Potential of Abamectin when Used by Ground Boom Application Equipment in Row Crops:

Strawberries, Tomatoes, Celery and Head Lettuce
Florida
Western Region (California, Arizona and Texas)

Reviewer's Conclusions

With respect to voluntary use restrictions on proposed product labeling for avermectin B_1 (May 14,1993) and public materials submitted to the Agency for Western Region and Florida, EFGWB concurs that with such restrictions, Avermectin B_1 may be used on planting beds with irrigation during dry seasons without excessive loadings by runoff to receiving bodies of water.

Western Region (California, Arizona, Texas)
Tomatoes, Strawberries / Lettuce and Celery

Application of avermectin B_1 is made by ground boom and does not exceed label concentrations, application rates, frequency of applications and maximum amounts per season.

These voluntary restrictions preclude applications of Avermectin B_1 by aerial spraying and thereby reduce the potential to contaminate nearby bodies of water directly by drift immediately following aerial application. In addition, the low grade (usually <~1%) and the high affinity of avermectin B_1 to bind to soils and the low precipitation during the growing period are factors which reduce the likelihood that runoff occurs.

Florida
Tomatoes, Strawberries / Lettuce and Celery

Application of avermectin B_1 is made by ground boom and does not exceed label concentrations, application rates, frequency of applications and maximum amounts per season.

These voluntary restrictions preclude applications of Avermectin B_1 by aerial spraying; thus, potential to contaminate nearby bodies of water (canals, ponds, lakes, coastal water) directly by drift immediately following such aerial application is obviated. In addition, the low grade (usually <~1%) and the high affinity of avermectin B_1 to bind to soils and the low precipitation during the growing period are factors which reduce the likelihood that runoff occurs.

Information for other geographic locations and crops mentioned in the November 20, 1992 letter was not included with this review:

Cotton
Citrus
Strawberries, Lettuce, Celery
Idaho, Michigan, New York, Pennsylvania, Utah
Pears
California, Oregon, Washington
Almonds & Walnuts
Other Minor Use Crops (23 states)
Pears, Hops, Tomatoes, Celery, Lettuce, Strawberries, Melons, Peppers

Specific Comments are made on pages 9-11 of the EFGWB Document No.: 92-1111 D179965

Enclosure: EFGWB No. 92-1111 Pages 1-15.